

CLAIM AMENDMENTS

1 1. (Currently Amended) A computer-implemented method of ~~selectively~~ allocating
2 storage to a host processor, comprising:
3 a control processor receiving a request to allocate storage to the host processor; and
4 the control processor ~~configuring a virtual storage layer to logically associate~~
5 associating one or more logical units from among one or more storage units to
6 the host processor by;
7 the control processor configuring a gateway device ~~in the virtual storage layer~~
8 to map the one or more logical units to ~~a boot port of the~~ host
9 processor[[,]]; and
10 the control processor configuring the one or more storage units to give the host
11 processor access to the one or more logical units;
12 wherein the control processor is separate from the gateway device, the host
13 processor, and the one or more storage units; and
14 wherein the gateway device is separate from the control processor, the host
15 processor, and the one or more storage units.

1 2. (Currently Amended) A method as recited in Claim 1, wherein;
2 the ~~configuring step is carried out~~ steps are performed by the control processor without
3 modification to an operating system of the host processor;
4 the gateway device is included in a virtual storage layer;
5 the control processor configures the gateway device to map the one or more logical
6 units to a boot port of the host processor;
7 the control processor is coupled through one or more storage networks to a plurality of
8 storage gateways that includes the gateway device; and
9 the plurality of storage gateways are coupled through the storage networks to the one
10 or more storage units.

1 3.-6. (Cancelled)

1 7. (Currently Amended) A method as recited in Claim 1, ~~wherein~~ further comprising:
2 ~~the method further comprises the step of storing~~ the control processor causing the
3 storage of first information that associates processors to logical units[[,]]; ~~the control processor causing the storage of~~ and second information that associates
4 logical units to storage units[[,]]; and
5 ~~the configuring~~ associating step further comprises ~~the step of the control processor~~
6 mapping the one or more logical units from among the one or more storage
7 units to a boot port of the host processor by reconfiguring the virtual storage
8 layer gateway device to logically couple the one or more logical units to the
9 boot port based on the stored first information and the stored second
10 information.
11

1 8. (Currently Amended) A method as recited in Claim 1, further comprising:
2 ~~the step of the control processor~~ generating the request to allocate storage at a control
3 processor that;
4 wherein the control processor is communicatively coupled to a control database[[,]]; and
5 wherein the request is directed from the control processor to a storage manager; and
6 wherein the storage manager ~~that~~ is communicatively coupled to the control processor,
7 the control database, and a storage network that includes ~~a disk~~ the gateway
8 device.[[,]] and
9 ~~wherein the step of configuring the virtual storage layer includes reconfiguring the disk~~
10 gateway to logically couple the one or more logical units to a boot port of the
11 processor.

1 9. (Currently Amended) A method as recited in Claim 8, further comprising the step of
2 the control processor causing issuing instructions from the storage manager to issue
3 instructions to the one or more storage units to give the host processor access to the
4 one or more logical units.

1 10. (Currently Amended) A method as recited in Claim 1, wherein the ~~configuring~~
2 associating step further comprises ~~the steps of~~:
3 the control processor identifying the one or more logical units (LUNs) of the one or
4 more storage units that have a sufficient amount of storage to satisfy the
5 request;
6 the control processor instructing a storage ~~the gateway device in the virtual storage~~
7 ~~layer~~ to map the identified LUNs to the small computer system interface
8 (SCSI) port zero of the host processor based on a unique processor identifier;
9 and
10 the control processor instructing the one or more storage units to give the host
11 processor having the unique host identifier access to the identified LUNs.

1 11. (Currently Amended) A method as recited in Claim 1, wherein the request is a first
2 request, and the ~~configuring~~ associating step further comprises:
3 the control processor issuing a second request to allocate one or more volumes on one
4 of the one or more storage units;
5 the control processor issuing a third request to make a concatenated volume using the
6 one or more allocated volumes;
7 the control processor causing ~~configuring~~ the concatenated volume to be configured
8 for use with the host processor;
9 the control processor issuing first instructions to the one or more storage units to bind
10 the host processor to the concatenated volume by giving the host processor
11 access to the concatenated volume;
12 the control processor issuing second instructions to ~~[[a]] the gateway device in the~~
13 ~~virtual storage layer~~ to bind the concatenated volume to the host processor.

1 12. (Currently Amended) A method as recited in Claim 11, further comprising ~~the steps~~
2 ~~of~~:
3 the control processor determining that the second instructions have failed to bind the
4 concatenated volume to the host processor;

5 the control processor issuing third instructions to the one or more storage units to
6 un-bind the host processor from the concatenated volume;
7 the control processor determining that the first instructions have failed to bind the host
8 processor to the concatenated volume; and
9 the control processor issuing fourth instructions to the one or more storage units to
10 break the concatenated volume.

1 13. (Cancelled)

1 14. (Currently Amended) A method as recited in Claim 1, wherein the one or more logical
2 units associated with the host processor include at least ~~one~~ a first logical unit from a
3 first volume from a first storage unit of the one or more storage units[[,]] and at least
4 ~~one~~ a second logical unit from a second volume from a second storage unit of among
5 the one or more storage units.

1 15. (Currently Amended) A method as recited in Claim 1, wherein the request to allocate
2 storage specifies a parameter selected from the group consisting of an amount of
3 storage to be allocated and a type of storage to be allocated.

1 16.-39. (Cancelled)

1 40. (New) A computer-readable medium for allocating storage to a host processor, the
2 computer-readable medium carrying one or more sequences of instructions which,
3 when executed by one or more processors, cause the one or more processors to carry
4 out the steps of:
5 the control processor receiving a request to allocate storage to the host processor; and
6 the control processor associating one or more logical units from among one or more
7 storage units to the host processor by:
8 the control processor configuring a gateway device to map the one or more
9 logical units to the host processor:
10 the control processor configuring the one or more storage units to give the host
11 processor access to the one or more logical units;

12 wherein the control processor is separate from the gateway device, the host
13 processor, and the one or more storage units; and
14 wherein the gateway device is separate from the control processor, the host
15 processor, and the one or more storage units.

1 41. (New) A computer-readable medium as recited in Claim 40, wherein:
2 the configuring steps are performed by the control processor without modification to
3 an operating system of the host processor;
4 the gateway device is included in a virtual storage layer;
5 the control processor configures the gateway device to map the one or more logical
6 units to a boot port of the host processor;
7 the control processor is coupled through one or more storage networks to a plurality of
8 storage gateways that includes the gateway device; and
9 the plurality of storage gateways are coupled through the storage networks to the one
10 or more storage units.

1 42. (Currently Amended) A computer-readable medium as recited in Claim 40, further
2 comprising one or more sequences of instructions which, when executed by the control
3 one or more processors, cause the one or more processors to carry out the steps of:
4 the control processor causing the storage of first information that associates processors
5 to logical units;
6 the control processor causing the storage of second information that associates logical
7 units to storage units; and
8 the instructions for associating further comprise one or more sequences of instructions
9 which, when executed by the one or more processors, cause the one or more
10 processors to carry out the step of the control processor mapping the one or
11 more logical units from among the one or more storage units to a boot port of
12 the host processor by reconfiguring the gateway device to logically couple the
13 one or more logical units to the boot port based on the stored first information
14 and the stored second information.

1 43. (New) A computer-readable medium as recited in Claim 40, further comprising one or
2 more sequences of instructions which, when executed by the one or more processors,
3 cause the one or more processors to carry out the step of:
4 the control processor generating the request to allocate storage;
5 wherein the control processor is communicatively coupled to a control database;
6 wherein the request is directed from the control processor to a storage manager; and
7 wherein the storage manager is communicatively coupled to the control processor, the
8 control database, and a storage network that includes the gateway device.

1 44. (New) A computer-readable medium as recited in Claim 43, further comprising one or
2 more sequences of instructions which, when executed by the one or more processors,
3 cause the one or more processors to carry out the step of the control processor causing
4 the storage manager issue instructions to the one or more storage units to give the host
5 processor access to the one or more logical units.

1 45. (New) A computer-readable medium as recited in Claim 40, wherein the one or more
2 sequences of instructions for associating further comprise one or more sequences of
3 instructions which, when executed by the one or more processors, cause the one or
4 more processors to carry out the steps of:
5 the control processor identifying the one or more logical units (LUNs) of the one or
6 more storage units that have a sufficient amount of storage to satisfy the
7 request;
8 the control processor instructing the gateway device to map the identified LUNs to the
9 small computer system interface (SCSI) port zero of the host processor based
10 on a unique processor identifier; and
11 the control processor instructing the one or more storage units to give the host
12 processor having the unique host identifier access to the identified LUNs.

1 46. (Currently Amended) A computer-readable medium as recited in Claim 40, wherein
2 the request is a first request, and the instructions for associating further comprise one
3 or more sequences of instructions which, when executed by the one or more
4 processors, cause the one or more processors to carry out the steps of:
5 the control processor issuing a second request to allocate one or more volumes on one
6 of the one or more storage units;
7 the control processor issuing a third request to make a concatenated volume using the
8 one or more allocated volumes;
9 the control processor causing the concatenated volume to be configured for use with
10 the host processor;
11 the control processor issuing first instructions to the one or more storage units to bind
12 the host processor to the concatenated volume by giving the host processor
13 access to the concatenated volume;
14 the control processor issuing second instructions to the gateway device to bind the
15 concatenated volume to the host processor.

1 47. (New) A computer-readable medium as recited in Claim 46, further comprising one or
2 more sequences of instructions which, when executed by the one or more processors,
3 cause the one or more processors to carry out the steps of:
4 the control processor determining that the second instructions have failed to bind the
5 concatenated volume to the host processor;
6 the control processor issuing third instructions to the one or more storage units to
7 un-bind the host processor from the concatenated volume;
8 the control processor determining that the first instructions have failed to bind the host
9 processor to the concatenated volume; and
10 the control processor issuing fourth instructions to the one or more storage units to
11 break the concatenated volume.

1 48. (New) A computer-readable medium as recited in Claim 40, wherein the one or more
2 logical units associated with the host processor include at least a first logical unit from
3 a first volume from a first storage unit of the one or more storage units and at least a
4 second logical unit from a second volume from a second storage unit of the one or
5 more storage units.

1 49. (New) A computer-readable medium as recited in Claim 40, wherein the request to
2 allocate storage specifies a parameter selected from the group consisting of an amount
3 of storage to be allocated and a type of storage to be allocated.

1 50. (New) An apparatus for allocating storage to a host processor, the apparatus
2 comprising a control processor that is configured to carry out the steps of:
3 receiving a request to allocate storage to the host processor; and
4 associating one or more logical units from among one or more storage units to the host
5 processor by:
6 configuring a gateway device to map the one or more logical units to the host
7 processor;
8 configuring the one or more storage units to give the host processor access to
9 the one or more logical units;
10 wherein the control processor is separate from the gateway device, the host
11 processor, and the one or more storage units; and
12 wherein the gateway device is separate from the control processor, the host
13 processor, and the one or more storage units.

1 51. (New) An apparatus as recited in Claim 50, wherein:
2 the configuring steps are performed by the control processor without modification to
3 an operating system of the host processor;
4 the gateway device is included in a virtual storage layer;
5 the control processor configures the gateway device to map the one or more logical
6 units to a boot port of the host processor;

7 the control processor is coupled through one or more storage networks to a plurality of
8 storage gateways that includes the gateway device; and
9 the plurality of storage gateways are coupled through the storage networks to the one
10 or more storage units.

1 52. (Currently Amended) An apparatus as recited in Claim 50, wherein the control
2 processor is further configured to carry out the steps of:
3 causing the storage of first information that associates processors to logical units;
4 causing the storage of second information that associates logical units to storage units;
5 and
6 wherein the control processor being configured for associating further comprises
7 configuring the control processor to carry out the step of mapping the one or
8 more logical units from among the one or more storage units to a boot port of
9 the host processor by reconfiguring the gateway device to logically couple the
10 one or more logical units to the boot port based on the stored first information
11 and the stored second information.

1 53. (New) An apparatus as recited in Claim 50, wherein the control processor is further
2 configured to carry out the step of:
3 generating the request to allocate storage;
4 wherein the control processor is communicatively coupled to a control database;
5 wherein the request is directed from the control processor to a storage manager; and
6 wherein the storage manager is communicatively coupled to the control processor, the
7 control database, and a storage network that includes the gateway device.

1 54. (New) An apparatus as recited in Claim 53, wherein the control processor is further
2 configured to cause the storage manager issue instructions to the one or more storage
3 units to give the host processor access to the one or more logical units.

1 55. (New) An apparatus as recited in Claim 50, wherein the control processing being
2 configured for associating further comprises configuring the control processor to carry
3 out the steps of:
4 identifying the one or more logical units (LUNs) of the one or more storage units that
5 have a sufficient amount of storage to satisfy the request;
6 instructing the gateway device to map the identified LUNs to the small computer
7 system interface (SCSI) port zero of the host processor based on a unique
8 processor identifier; and
9 instructing the one or more storage units to give the host processor having the unique
10 host identifier access to the identified LUNs.

1 56. (Currently Amended) An apparatus as recited in Claim 50, wherein the request is a
2 first request, and configuring the control processor for associating further comprises
3 configuring the control processor to carry out the steps of:
4 issuing a second request to allocate one or more volumes on one of the one or more
5 storage units;
6 issuing a third request to make a concatenated volume using the one or more allocated
7 volumes;
8 causing the concatenated volume to be configured for use with the host processor;
9 issuing first instructions to the one or more storage units to bind the host processor to
10 the concatenated volume by giving the host processor access to the
11 concatenated volume;
12 issuing second instructions to the gateway device to bind the concatenated volume to
13 the host processor.

1 57. (New) An apparatus as recited in Claim 56, wherein the control processor is further
2 configured to carry out the steps of:
3 determining that the second instructions have failed to bind the concatenated volume
4 to the host processor;

5 issuing third instructions to the one or more storage units to un-bind the host processor
6 from the concatenated volume;
7 determining that the first instructions have failed to bind the host processor to the
8 concatenated volume; and
9 issuing fourth instructions to the one or more storage units to break the concatenated
10 volume.

1 58. (New) An apparatus as recited in Claim 50, wherein the one or more logical units
2 associated with the host processor include at least a first logical unit from a first
3 volume from a first storage unit of the one or more storage units and at least a second
4 logical unit from a second volume from a second storage unit of the one or more
5 storage units.

1 59. (New) An apparatus as recited in Claim 50, wherein the request to allocate storage
2 specifies a parameter selected from the group consisting of an amount of storage to be
3 allocated and a type of storage to be allocated.